National Institute of Environmental Health Sciences

Ambient temperature and emergency department visits for heat-related illness in North Carolina, 2007-2008

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Abstract:

PURPOSE: To estimate the association between environmental temperatures and the occurrence of emergency department visits for heat-related illness in North Carolina, a large Southern state with 85 rural and 15 urban counties; approximately half the state's population resides in urban counties. METHODS: County-level daily emergency department visit counts and daily mean temperatures for the period 1/1/2007-12/31/2008 were merged to form a time-series data structure. Incidence rates were calculated by sex, age group, region, day of week, and month. Incidence rate ratios were estimated using categorical and linear spline Poisson regression models and heterogeneity of the temperature-emergency department visit association was assessed using product interaction terms in the Poisson models. RESULTS: In 2007-2008, there were 2539 emergency department visits with heat-related illness as the primary diagnosis. Incidence rates were highest among young adult males (19-44 year age group), in rural counties, and in the Sandhills region. Incidence rates increased exponentially with temperatures over 15.6 degrees C (60 degrees F). The overall incidence rate ratio for each 1 degrees C increase over 15.6 degrees C in daily mean temperature was 1.43 (95%CI: 1.41, 1.45); temperature effects were greater for males than females, for 45-64 year olds, and for residents of rural counties than residents of urban counties. CONCLUSIONS: As heat response plans are developed, they should incorporate findings on climate effects for both mortality and morbidity. While forecast-triggered heat health warning systems are essential to mitigate the effects of extreme heat events, public health preparedness plans should not ignore the effects of more persistently observed high environmental temperatures like those that occur throughout the warm season in North Carolina.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Rural, Urban

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified